

THE CALIFORNIA REPORT ON CORONARY ARTERY BYPASS GRAFT SURGERY

1999 Hospital Data

Technical Report

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Additional copies of the Technical Report can be obtained through the PBGH (www.pbgh.org) and OSHPD (www.oshpd.state.ca.us) Web sites. PBGH posts the hospital performance results on its California Consumer HealthScope Web site (www.healthscope.org), a public source of information on healthcare quality for California consumers.

PREFACE

August 2003

We are pleased to release ***The California Report on Coronary Artery Bypass Graft Surgery: 1999 Hospital Data***, the second report from the California Coronary Artery Bypass Graft (CABG) Mortality Reporting Program (CCMRP). The report reflects the continuation of an important partnership between the state, purchasers, and hospitals to voluntarily collect and release hospital performance data on mortality associated with coronary artery bypass graft surgery. In an environment of scarce resources, collaboration is critical.

Data on 70 of the 119 hospitals that regularly performed bypass surgery in 1999 are summarized in this report. These 70 hospitals performed approximately 68% of all isolated coronary artery bypass graft surgeries in California in 1999. For the 1999 analysis period, the overall in-hospital death rate for bypass surgery was 2.76% among the participating hospitals.

All 70 participating hospitals are to be commended for their explicit commitment to quality improvement—for which measurement and public accountability are requisite steps in the quality improvement process. The transparency of hospital performance information is critical to national efforts to close the quality gap identified in the Institute of Medicine's report *Crossing the Quality Chasm* (2001). Through concerted, collaborative efforts to measure and reduce performance variations, we can take concrete steps to ensure that the care provided by California hospitals is safe, effective, and efficiently delivered.

The important work of CCMRP over the last five years, which laid the foundation for public reporting of CABG outcomes and highlighted differences in death rates between participating and non-participating hospitals, set the stage for compulsory reporting of bypass surgery outcomes for hospitals and surgeons in California. The passage of Senate Bill 680 (Chapter 898, Statutes of 2001) replaces CCMRP with the California CABG Outcomes Reporting Program (CCORP) operated by OSHPD. CCORP begins its data reporting with the 2003 hospital data submission; meanwhile, CCMRP continues its work to close out the 2000-2002 data period.

Through this important partnership, our goal is to produce information that will be used to improve health outcomes for all patients who undergo bypass surgery, regardless of the hospital that they and their physicians select. To do so requires that we have knowledge about performance and that we apply this knowledge to drive improvements in the quality of care and reward those institutions that have demonstrated excellence in performance.



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SUMMARY

In 1995, the Pacific Business Group on Health (PBGH) and the California Office of Statewide Health Planning and Development (OSHPD) entered into a private-public sector partnership to establish a statewide reporting program for coronary artery bypass graft (CABG) surgery. The program, the **California CABG Mortality Reporting Program (CCMRP)**, is a voluntary reporting system to produce in-hospital mortality results for California hospitals. The voluntary nature of CCMRP stands in contrast to the other statewide CABG reporting programs operated by New York, New Jersey, Pennsylvania, and Massachusetts, all of which mandate hospitals to collect and publicly report performance data. Only recently did California enact legislation that mandates the submission of hospital and surgeon CABG performance data for all hospitals commencing January 1, 2003.

The CCMRP **1999 Hospital Data Report** presents findings from analyses of data collected from 70 of California's 119 hospitals that regularly performed CABG surgery during 1999, and focuses on in-hospital mortality as the key outcome measure.¹ The report includes results for calendar year 1999 (**1999 Analysis**) and results that represent the roll-up of all continuous quarters of data submitted by hospitals since they joined CCMRP (**All Quarters Analysis**).² The **1999 Analysis** includes a total of 21,973 cases from all hospitals that submitted data to CCMRP for 1999, making it the largest public reporting program on CABG outcomes in the United States.

It is important to understand the reasons for the time lapse between the end of the analytic period (year-end 1999) and the publication date of this report. The process of collecting and cleaning clinical data, verifying the accuracy of hospital data submissions through audit and other cross validation procedures, running risk models and allowing hospitals to review results prior to publication is an iterative and time intensive process. Several factors contribute to the time lag including: 1) incomplete and often incorrect initial data submissions from hospitals which require substantial follow-up to correct; 2) slow responses by hospitals to CCMRP requests for data corrections; 3) an 18-month lag associated with the availability of the OSHPD Patient Discharge Data (PDD) to cross validate deaths and case counts from hospitals; and 4) time required to prepare the final report, allow for review of results by hospitals and the Technical Advisory Committee, and for final review and approval by the State prior to publication. At the time this report was published, other states with cardiac reporting programs had released reports displaying data from 1998, 1999, and 2000 (primarily those relying on administrative data to produce their reports).³

Key findings from the **1999 Analysis** are:

¹ In-hospital mortality means that the patient expired prior to discharge from the hospital that performed this operation, regardless of length of stay. Deaths are not counted after discharge even if the patient dies soon after the operation. If a patient is transferred post-operatively to a rehabilitation or transitional care facility and dies before going home, this death is not counted.

² CCMRP began enrolling hospitals in the program starting January 1, 1997. Enrollment in the program was ongoing during the 1997-1999 period. As a result, hospitals continuously participating since their enrollment in the program will have different numbers for their "quarters of participation". The maximum number of quarters of participation for any one hospital is 12—representing full year participation in 1997, 1998, and 1999. The minimum number of quarters of participation required for inclusion in this report is four, representing full calendar year 1999. Results for 1997-1998 data can be found in the report published by CCMRP in July 2001.

³ Reports from other states display data from: Texas (2000), Virginia (2000), Pennsylvania (2000), New York (1997-1999), New Jersey (1998).

- The overall in-hospital death rate in California among participating hospitals was 2.76% for 1999 (meaning slightly fewer than 3 deaths per 100 cases), as compared to 2.60% for 1997-1998. Nationally, the Society of Thoracic Surgeons reports an “operative mortality” rate for isolated bypass surgery of 2.90% for 1999.⁴
- Most California hospitals are performing within the range of what was expected. Sixty-seven out of the 70 hospitals performed “as expected,” meaning that the actual death rates at these institutions were within range of what was expected given the complexity of cases they treated.
- Three of the 70 hospitals performed significantly “worse than expected,” meaning their actual death rate was higher than expected given the complexity of cases they treated. The three hospitals were Desert Regional Medical Center, Marin General Hospital, and Scripps Mercy.
- None of the 70 hospitals performed significantly “better than expected,” meaning that no hospital’s actual death rate was lower than expected given the complexity of cases they treated. The fact that no hospitals are classified as “better than expected” is not too surprising given the low mortality rate associated with bypass surgery (fewer than 3 deaths for every 100 cases in 1999). The low death rate makes it very difficult for a hospital to distinguish itself as a “good” outlier (note: a hospital must operate on sick people and do well with these patients to achieve “better than expected” performance results). The problem of distinguishing “better than expected” performance is exacerbated by looking at a single year’s worth of data, where confidence intervals can be quite wide for hospitals with low case volumes.

Other major findings in this report include:

- The overall in-hospital death rate in California among the 70 hospitals included in the **All Quarters Analysis** was 2.60%.
- The **All Quarters Analysis** revealed that five hospitals performed “better than expected,” 59 hospitals performed “as expected,” and six hospitals performed “worse than expected.” The five hospitals that performed “better than expected” were: Doctor’s Medical Center-San Pablo, Heart Hospital of the Desert, Scripps Memorial Hospital, Summit Medical Center, and Sutter Memorial Hospital. The six hospitals that performed “worse than expected” were: Alta Bates Medical Center, Desert Regional Medical Center, Marin General Hospital, Memorial Medical Center of Modesto, Presbyterian Intercommunity Hospital, and Scripps Mercy.
- The **All Quarters Analysis**, which is based on more than one year’s mortality outcomes for the majority of hospitals⁵, may allow more precision in evaluating each hospital’s “true” performance. This is especially important in assessing outcomes for small volume hospitals, whose mortality experience tends to be more variable year-to-year (i.e., in making estimates from any period of data, the confidence intervals widen as the number of cases decreases).

⁴ Operative mortality refers to 30-day mortality. Most deaths “in hospital” occur within 30 days. The “operative mortality” rate tends to be slightly higher than the “in hospital” mortality rate.

⁵ Twelve hospitals began participation in 1999; their All Quarters rate thus reflects performance solely for that single year.

- Raw unadjusted mortality rates give a false impression of a hospital's relative performance, which underscores the importance of risk adjustment when producing performance ratings. When compared to unadjusted CCMRP results, the adjusted hospital results led to 17 changes in performance ratings among 81 hospitals.
- The expected death rate ranged from 1.2% to 5.4%, revealing wide variation among California hospitals with respect to the case mix of patients they treat. This underscores the importance of adjusting for differences in case mix to produce outcome scores.
- There was a high degree of agreement between the actual number of deaths and the predicted numbers of deaths from the risk-adjustment model. This means that the risk model gives hospitals appropriate credit for treating more complex cases. Consequently, hospitals and surgeons should not exclude high-risk patients from appropriate CABG surgeries as a means to improve performance scores.
- Our ongoing evaluation of the relationship between the volume of CABG procedures a hospital performs and in-hospital mortality continues to find wide variation in the performance of hospitals with relatively low case volumes (<300 cases) and less variation in the performance of hospitals with relatively high case volumes. From the **All Quarters Analysis**, we find that on average, CCMRP hospitals with mean annual volumes of 300 or more cases experienced statistically significantly lower mortality than hospitals with fewer than 200 cases annually. This finding raises concerns about the performance of hospitals whose results do not appear in this report, as 35 of the 49 non-participants had annual surgical volumes fewer than 200 cases.
- Based on data from OSHPD's PDD, the raw, unadjusted mortality rate for the 49 hospitals that decided not to participate in CCMRP was 3.34% in 1999, versus an unadjusted mortality rate of 2.73% for the 70 participants⁶. Of the 49 non-participants, 11 submitted usable data but were either dropped (2 hospitals) or withdrew (9 hospitals) prior to publication of this report. The raw, unadjusted in-hospital death rate for the 11 hospitals was 3.21%. Non-participants tended to have worse performance results than did participants, underscoring the need for compulsory reporting.

⁶ Calculations of observed mortality rates differ slightly depending on the data source. When comparing CCMRP non-participating hospitals to CCMRP participants, it was necessary to utilize data from OSHPD's PDD. All other analyses are based on data submitted directly to CCMRP from participating hospitals.

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GLOSSARY OF FREQUENTLY USED ACRONYMS

BMI	Body mass index
BSA	Body surface area
CABG	Coronary artery bypass graft
CASTS	California Chapter of the Society of Thoracic Surgeons
CCMRP	California Coronary Artery Bypass Graft (CABG) Mortality Reporting Program
CCORP	California CABG Outcomes Reporting Program (Mandatory)
CCS	Canadian Cardiovascular Society
CHF	Congestive heart failure
COPD	Chronic obstructive pulmonary disease
ICD-9-CM	International Classification of Diseases, 9 th Revision, Clinical Modification
MI	Myocardial infarction
NYHA	New York Heart Association
O/E ratio	Observed to expected ratio
OSHPD	Office of Statewide Health Planning and Development
PBGH	Pacific Business Group on Health
PDD	Patient Discharge Database (OSHPD)
PTCA	Percutaneous transluminal coronary angioplasty
STS	Society of Thoracic Surgeons
TAP	Technical Advisory Panel (CCMRP)